

United States Patent [19]

Tatsuta



US005943448A

[11] Patent Number: 5,943,448

[45] Date of Patent: Aug. 24, 1999

[54] INFORMATION REPRODUCING SYSTEM,  
INFORMATION RECORDING MEDIUM,  
AND INFORMATION RECORDING  
APPARATUS

[75] Inventor: Seiji Tatsuta, Hachioji, Japan

[73] Assignee: Olympus Optical Co., Ltd., Tokyo,  
Japan

[21] Appl. No.: 08/764,136

[22] Filed: Dec. 12, 1996

[30] Foreign Application Priority Data

Dec. 25, 1995 [JP] Japan 7-336800

[51] Int. Cl. G06K 9/38; G06T 7 60

[52] U.S. Cl. 382/270; 382 286

[58] Field of Search 382 270, 286,  
382,312, 321, 317, 287; 358 465, 466

[56] References Cited

FOREIGN PATENT DOCUMENTS

0 670 555 A1 9 1995 European Pat. Off.  
0 717 398 A3 6/1996 European Pat. Off.

59-61383 4 1984 Japan

Primary Examiner—Scott Rogers  
Attorney, Agent, or Firm—Frischaufl, Holtz, Goodman,  
Langer & Chick, P.C.

[57] ABSTRACT

A binarizing section generates binarized data from an image signal of a dot code on an information recording medium read by a code reading section. The binarizing section has a reference dot detection section, a dot area measuring section, a threshold value modifying section and a threshold value determining section. The reference dot detection section binarizes the image signal with a predetermined threshold value prior to generating binarized data to detect a reference dot from a binarized code image. The dot area measuring section measures the area of the reference dot detected by the reference dot detection section. The threshold value modifying section modifies the threshold value for binarization in such a manner that the area measured by the dot area measuring section approaches a predetermined target value. The threshold value determining section binarizes the image signal with the threshold value modified by the threshold value modifying section.

24 Claims, 50 Drawing Sheets

